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Mark Y. An

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FANN-MKE C/O  
FOLEY & LARDNER LLP  
777 EAST WISCONSIN AVENUE  
MILWAUKEE, WI 53202-5306

EXAMINER

TROTTER, SCOTT S

ART UNIT

PAPER NUMBER

3694

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/816,496	<b>Applicant(s)</b> AN ET AL.	
	<b>Examiner</b> SCOTT S. TROTTER	<b>Art Unit</b> 3694	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 11-16 and 20-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-16 and 20-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>September 29, 2009</u> .                                      | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This action is in response to the remarks received August 25, 2009. This action is **Final**.

#### ***Response to Argument***

2. As for first and second mathematical model Keyes uses different models to arrive at the values depending on the amount of information available. (*See at least Keyes abstract*. Partial sample underwriting (one model) and inferred values of the remainder (second model).) Also whether a system has one complicated mathematical model or two or more mathematical models which are combined is completely subjective. Focus on what the "two models" are doing that is novel is more likely to yield a clear concept than a focus on one model or two.
3. Keyes uses "sample underwriting" which would involve all the factors that would effect the value of the loans being underwritten.
4. As for an adverse event that is drawn to finding the proper price for a set of loans the adverse event is the amount of defaulting of the loans involved and finding the proper price to pay inherently includes pricing in those adverse events.
5. Cluster valuation and confidence are measures of error and are stored and monitored as such. (*See at least Keyes column 6 lines 31-65*)
6. The random drawing of error values is the clustering.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 11, 16, 20, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Keyes et al. (U.S. Patent 7,165,043 B2 hereafter Keyes).

As per claim 11 Keyes teaches:

Machine readable media having stored therein a set of instructions that when executed cause a computer to implement a process for determining a probability of an adverse event in connection with a plurality of loans, the plurality of loans having varying amounts of loan data available, the process comprising:

constructing a first mathematical model for use with loans for which loan data is available for a set of explanatory variables, the set of explanatory variables including variables that relate to risk characteristics of the loan, risk characteristics of collateral for the loan, and risk characteristics of a borrower associated with the loan; (see *Keyes abstract and column 1 line 53-column 2 line 21*)

constructing a second mathematical model for use with loans for which at least some of the loan data for the set of explanatory variables is not available, including estimating the probability of the adverse event for a first group of loans for which the

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loan data is available for the set of explanatory variables using the first mathematical model, (*see Keyes column 1 lines 60-65*)

iteratively estimating the probability of the adverse event for the first group of loans using the second mathematical model, (*see Keyes column 2 lines 14-21*)

selecting an optimal set of weighting coefficients for the second mathematical model, the optimal set of coefficients being selected so as to minimize errors in outputs generated by the second mathematical model for the first group of loans relative to outputs generated by the first mathematical model for the first group of loans, and storing a set of error values, the set of error values relating to the errors in the outputs generated by the second mathematical when using the optimal set of coefficients relative to the outputs generated by the first mathematical model; (*see Keyes column 2 lines 14-21 and column 6 lines 11-65*) and

estimating the probability of the adverse event for a second group of loans using the second mathematical model, wherein at least some loan data for the set of explanatory variables is not available for the second group of loans, and wherein estimating the probability of the adverse event for the second group of loans includes randomly drawing error values from the set of error values and adjusting the outputs of the second mathematical model for the second group of loans in accordance with the randomly drawn error values, the randomly drawn error values causing a distribution of the probability values produced by the second mathematical model for the second group of loans to more closely match a distribution of the probability values produced by

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the first mathematical model for the first group of loans. (see *Keyes column 6 lines 4-10*)

As per claims 16 and 22 Keyes teaches:

The machine-readable media of claim 11, wherein the set of explanatory variables includes a credit premium, the credit premium reflecting a premium paid by a borrower in a note rate of the loan as compared to an average note rate of similar loans made to other borrowers. (see *Keyes column 4 lines 1-10*. The credit premium paid is asset data which Keyes calls for data to be evaluated to see if it helps find the assets value.)

As per claim 20 Keyes teaches:

Machine readable media having stored therein a set of instructions that when executed cause a computer to implement a process comprising:

estimating a first set of weighting coefficients for a first mathematical model by performing a first regression operation, the first mathematical model being a function of a predetermined set of loan parameters and the first set of weighting coefficients, the first set of weighting coefficients being associated with respective ones of the predetermined set of loan parameters, the first regression operation optimizing the first set of weighting coefficients based on performance history of a first plurality of loans, the first plurality of loans having loan data available for the predetermined set of loan parameters; (see *Keyes abstract and column 1 line 53-column 2 line 21*)

estimating a second set of weighting coefficients for a second mathematical model by performing a second regression operation, the second model being a function

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of only a subset of the predetermined loan parameters and the second set of weighting coefficients, the second set of weighting coefficients being associated with respective ones of the subset of the predetermined set of loan parameters, the second regression operation causing the second mathematical model to produce a probability distribution which is in overall alignment with a probability distribution produced by the first mathematical, the second mathematical model further being a function of a set of stored error values relating to errors in probabilities produced by the second mathematical model as compared to probabilities produced by the first mathematical model; (see *Keyes column 1 line 60-column 2 line 21 and column 6 lines 11-65*) and

determining the probability of the adverse event using the second mathematical model in connection with a second plurality of loans, including randomly drawing error values from the set of error values and adjusting the outputs of the second mathematical model for the second plurality of loans in accordance with the randomly drawn error values, the randomly drawn error values causing a distribution of the probability values produced by the second mathematical model for the second plurality of loans to more closely match a distribution of the probability values produced by the first mathematical model for the first group of loans. (see *Keyes column 6 lines 4-10*)

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 12-15 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keyes in view of Starkman (U.S. Patent 7,188,084).

As per claim 12 Keyes teaches:

The machine-readable media of claim 11, wherein the adverse event is delinquency.

While Keyes does not explicitly address the kinds of adverse events that effect the valuation of the loan portfolios it teaches valuing, Starkman teaches finding delinquencies to help evaluate loan values. (*see Starkman column 2 lines 45-48*) Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to predict delinquencies since they would affect a loans value.

As per claim 13 Keyes teaches:

The machine-readable media of claim 11, wherein the adverse event is default.

While Keyes does not explicitly address the kinds of adverse events that effect the valuation of the loan portfolios it teaches valuing, Starkman teaches finding defaults to help evaluate loan values. (*see Starkman column 2 lines 29-34*) Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to predict defaults since they would affect a loans value.

As per claim 14 Keyes teaches:

The machine-readable media of claim 11, wherein the adverse event is prepayment.



While Keyes does not explicitly address the kinds of adverse events that effect the valuation of the loan portfolios it teaches valuing, Starkman teaches finding defaults to help evaluate loan values. (see *Starkman column 5 lines 54-61*) Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to predict prepayments since they would affect a loans value.

As per claims 15 and 21 Keyes teaches:

The machine-readable media of claim 11, wherein storing the set of error values includes partitioning the error values into different partition groups, each respective error value being partitioned according to a length of time of delinquency of a corresponding one of the loans. (See *Keyes figure 10*)

While Keyes does teach clustering assets by key characteristics it does not explicitly teach length of time delinquent as one of those key characteristics Starkman teaches using the term of delinquency to predict future payment behavior. (see *Starkman column 3 lines 3-63*) Therefore it would have been obvious to a person of ordinary skill in the art to use length of time of delinquency to partition (or cluster) the data with term of delinquency being one of the terms to considered since it is used to help determine the value of the loans.

11. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keyes in view of admitted prior art.

As per claim 23 Keyes teaches:

The machine-readable media of claim 22, wherein the credit premium is determined by starting with an initial note rate, adjusting the initial rate up and/or down

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in accordance with variables associated with the mortgage loan to arrive at a predicted note rate, and comparing the predicted note rate with a note rate paid by the borrower to arrive at the credit premium. (see *Keyes column 4 lines 1-10*. The credit premium paid is asset data which Keyes calls for data to be evaluated to see if it helps find the assets value.)

Keyes does not explicitly teach using the iterative method to solve for a value but it is admitted prior art in the art of mathematics to iteratively solve for a value as described in claim 23 with an example being the optimal algorithm for finding a random number between 1 and 100 where one can only find out if the number is higher or lower is to always pick the middle of the range starting with 50. Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to solve for the credit premium using that method since Keyes called for the use of iterative processes. (see *Keyes column 4 lines 1-10*)

### **Conclusion**

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication from the examiner should be directed to Scott S. Trotter, whose telephone number is 571-272-7366. The examiner can normally be reached on 8:30 AM – 5:00 PM, M-F.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James P. Trammell, can be reached on 571-272-6712.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

16. The fax phone number for the organization where this application or proceeding is assigned are as follows:

(571) 273-8300 (Official Communications; including After Final  
Communications labeled "BOX AF")

(571) 273-6705 (Draft Communications)

sst  
November 24, 2009

/James P Trammell/  
Supervisory Patent Examiner, Art Unit 3694